Trend Study 14-8-99

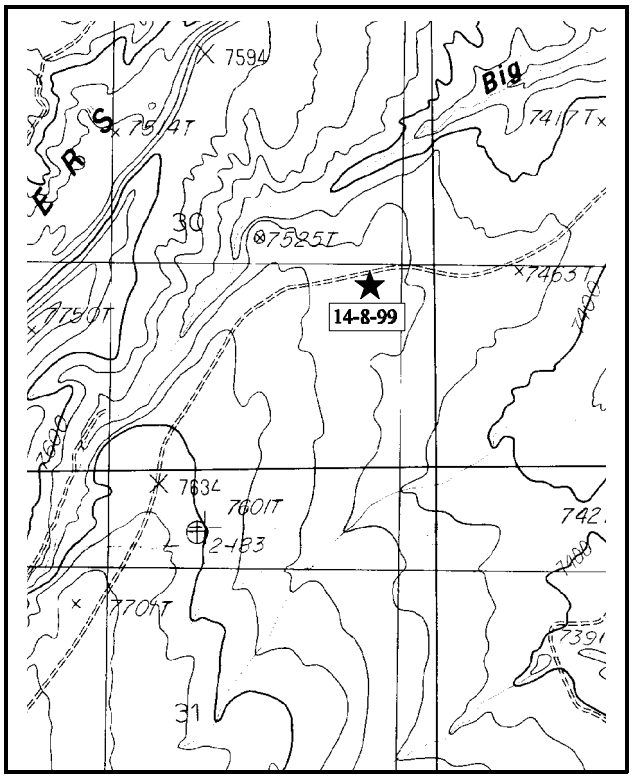
Study site name: Peters Point . Range type: Chained, Cabled, Seeded P-J.

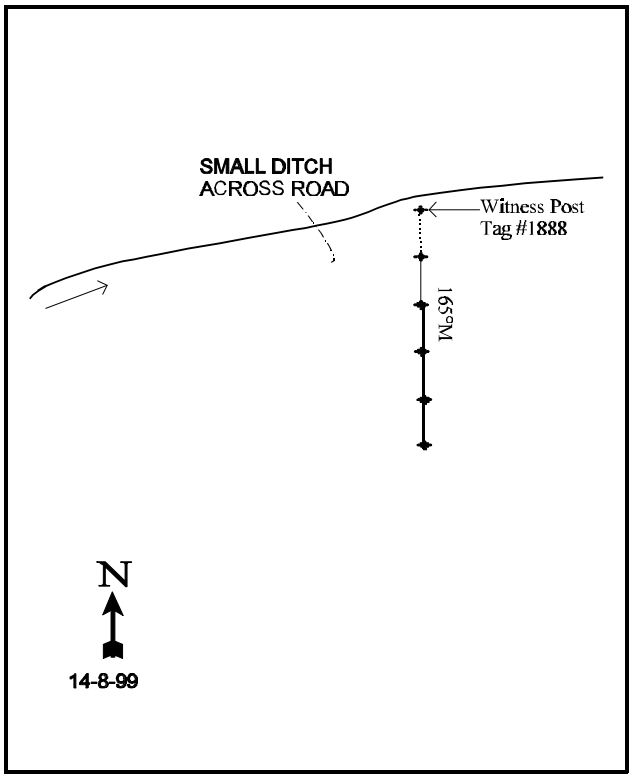
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Monticello Lake, take the dirt road (Spring Creek Road) 1.0 miles to a fork. Stay right and continue 2.2 miles to a fork. Turn left (F.S. Road 119) and go north 1.3 miles to a fork. Stay right towards an exclosure and go 0.25 miles to a cattleguard. Continue 0.8 miles to a fork. Stay left and continue 1.5 miles to a witness post on the right side of the road. The 0 foot stake is 100 feet south of the witness post, and has browse tag #1888 attached.





Map Name: Monticello Lake Diagrammatic Sketch

Township 32S , Range 23E , Section 30 UTM 4202852.821 N, 637552.911 E

DISCUSSION

Trend Study No. 14-8 (35-8)

Fifteen hundred acres of pinyon-juniper woodland on Peters Point Plateau on the northeast side of the Abajo Mountains were chained and seeded in 1962. The Forest Service conducted follow up treatments in 1985 which included burning the perimeter of the old chaining and a Tordon treatment of approximately 200 acres. There are plans to finish burning, chemically treat or roller-chop the chaining in the future. As with the two previous study sites, this area is grazed by cattle in the summer as part of the Harts Draw allotment. It is in the third unit in a rest-rotation grazing system. This area is considered spring-fall range for deer. A pellet group transect at 7,800 feet (USFS) and 7,300 feet (BLM) both show widely fluctuating use levels varying from 5-43 deer days use/acre (12-106 ddu/ha). Pellet group data from the higher elevation pellet group transects shows a 5-year average (1981-1986) of 21 deer days use/acre (52 ddu/ha), an increase over the previous 5-year average of 9 deer days use/acre (22 ddu/ha). The average deer days use/acre through 1993 continued to increase to 26 (64 ddu/ha), but after the hard winter of 1992-93 it has gone down to 17 deer days use/acre (42 ddu/ha). Pellet group data taken on the site in 1999 estimate 13 deer, 1 elk and 7 cow days use/acre (32 ddu/ha, 3 edu/ha, and 17 cdu/ha). Peters Point is just above the Harts Draw winter concentration area. This plateau has the potential to become an important elk wintering area.

The study site is near the road in the middle of the chaining. Elevation is 7,500 feet with a southeast aspect and on gentle slope. The availability of water is limited, although there are some seasonal sources and small stock ponds.

Soil at the site is relatively shallow with an effective rooting depth estimated at just under 12 inches. It is a reddish sandy loam with a neutral pH (7.2). The soil is extremely compacted with a hardpan apparent at about 6 to 7 inches in depth. It appears that this layer is mostly impervious to water. There is little rock on the surface or within the profile. Some pavement is concentrated on the surface in some scattered exposed spots, but this is still less than 2% cover. Almost 20% of the area was bare soil in 1986, increasing to 32% in 1994, and 35% in 1999. Much of this increase is from the loss of litter from the extended drought. Often the bare areas lead into small gullies, where recent soil movement is detectable. Overall the area has good cover, with a high percent of herbaceous cover. There is some erosion occurring but it appears minimal due to the lack of significant slope.

Encroachment by the juniper and pinyon into this particular area has been rather slow with an estimated combined density of 200 trees/acre in 1986. Tree density was estimated in 1994 using a point quarter method which is more accurate at estimating density of widely spaced trees. Point quarter data estimated 75 juniper and 19 pinyon trees/acre on the site. Average diameter of the juniper was 4.3 inches while that of pinyon averaged 2.6 inches. Point quarter data from 1999 estimate 68 juniper and 21 pinyon pine trees/acre. Average diameter of juniper is 4.2 inches while that of pinyon is 2.7 inches. Most of the trees are in the 4 to 6 foot high range. Seventeen percent of the juniper sampled were knocked down (tipped over), but still living trees which averaged 3 inches in diameter.

The key browse species on this site is mountain big sagebrush. Although some individuals had different leaf color and growth forms, they were all classified as mountain big sagebrush. The sagebrush in 1986 appeared to be very vigorous, moderately hedged, and their age class distribution indicated an increasing population. A majority of the plants sampled were mature plants. They had a biotic potential (proportion of seedlings to the population) of 7%, 29% were young, and only 7% were classified as decadent. By 1994 many of these healthy characteristics had declined, with 67% showing poor vigor and 21% of the plants classified as decadent. Utilization was light to moderate. Data from 1999 estimate 2,300 sagebrush plants/acre. Utilization is mostly light, vigor improved with those with poor vigor going from 67% to 6%, and percent decadence has declined from 21% to 8%. Recruitment is not as good as in past years, however there are enough seedlings and young to maintain the population.

Rubber rabbitbrush was the second most abundant browse species in 1986, but it has steadily declined in density from 1,432 plants/acre in 1986 to only 20 in 1999. Broom snakeweed is fairly abundant and has increased substantially since 1994. Individual plants are very small averaging only 4 inches in height. Shrubs not encountered on the density plots include scattered Gambel oak, large and lightly browsed serviceberry, and some true mountain mahogany. The increaser species (broom snakeweed, juniper, pricklypear cactus, and pinyon pine) are not yet numerous enough to really affect production of the more desirable shrub and herbaceous species.

The seeding treatment stressed crested wheatgrass and successfully established a dense stand. The wheatgrass occurs in vigorous, large patches that made up 81% of the total grass cover in 1994, increasing to 95% in 1999. This grass, and to a lesser extent the bottlebrush squirreltail, muttongrass, and slender wheatgrass, provides abundant spring and fall forage for deer and cattle and it is also valuable to elk in winter.

Forbs are less common, especially valuable forage species. Total forb cover currently ('99) makes up only 11% of the total vegetative cover. Species diversity is also low. Most numerous is rock goldenrod, an increaser, which has increased significantly in nested frequency since the 1994 reading. It provided 62% of the forb cover in 1994, increasing to 94% in 1999. Dusty penstemon, a valuable forage species, declined significantly in nested frequency since 1994.

1986 APPARENT TREND ASSESSMENT

Currently the old chaining is in good condition. The important forage species, shrubs and grasses, appear vigorous and most appear to be increasing. The age class, form, and vigor of the big sagebrush indicates an improving trend. It appears that the juniper are increasing, which is negative in the long term, and management plans already include further treatment to reduce their numbers. A complete elimination of all woody species would be a negative impact to deer habitat needs however. Cover is already limited on the large open chaining. Although there is some gully erosion, the increasing vegetation should improve soil cover and therefore trend. Disturbance of the soil by burning could accelerate erosion temporarily. A roller-chopper treatment would be a much better option to treat the chaining, for the litter left in place would protect the soils from high intensity summer storms.

1994 TREND ASSESSMENT

The chaining is still considered in good condition. The soil trend is judged to be slightly down with the large increase in percent bare ground (19% in 1986 to 32% in 1994). Soil trend is considered only slightly down because the herbaceous cover is abundant and makes up 69% of the total vegetative cover. Herbaceous cover is best for protecting the soils from high intensity summer storms. The key browse species, mountain big sagebrush, has shown an increase in it's density, but this is primarily because of the much larger sample size. More importantly is the percentage of plants expressing poor vigor which have increased from 5 to 67%. Percent decadence has also increased from 7 to 20%. The increased biotic potential (proportion of seedlings to the population) helps offset this downward tendency, which has increased from 7% up to 14%. The browse trend would still be judged slightly down. The herbaceous understory is rated as down because the nested frequency values for both grasses and forbs have decreased slightly and frequency of the most abundant grass, crested wheatgrass, declined significantly since the last reading. This downward trend is mostly the result of the prolonged drought since 1985.

TREND ASSESSMENT
soil - slightly down
browse - slightly down
herbaceous understory - down

1999 TREND ASSESSMENT

Trend for soil is stable with similar relative percent cover estimates for litter and bare ground. In addition, nested frequency of crested wheatgrass also increased significantly. Trend for browse is considered up slightly even though density of the key species, mountain big sagebrush declined slightly. Plants displaying poor vigor declined from 67% of the population to only 6%, while percent decadence declined from 21% to 8%. Seedlings and young are not as abundant, yet adequate to maintain the stand. Trend for the herbaceous understory is considered stable. Nested frequency of crested wheatgrass increased significantly, although sum of nested frequency for all herbaceous species remained at similar levels compared to 1994.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 8

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'94	'99	'86	'94	'99	'94	'99
G	Agropyron cristatum	b320	a242	b285	98	79	94	14.34	14.65
G	Agropyron trachycaulum	4	-	-	1	-	-	-	-
G	Bromus tectorum (a)	-	a8	b22	-	2	9	.78	.11
G	Koeleria cristata	a-	b14	ab3	-	4	1	1.54	.00
G	Oryzopsis hymenoides	-	4	5	-	2	2	.03	.15
G	Poa fendleriana	a3	b27	b20	2	11	10	.52	.56
G	Poa pratensis	-	7	-	-	2	-	.38	-
G	Sitanion hystrix	b9	a-	ab3	3	-	2	.00	.01
Total for Annual Grasses		0	8	22	0	2	9	0.78	0.11
Total for Perennial Grasses		336	294	316	104	98	109	16.82	15.38
Total for Grasses		336	302	338	104	100	118	17.60	15.50
F	Arabis spp.	1	4	1	1	2	1	.01	.00
F	Artemisia ludoviciana	1	-	-	1	-	-	-	-
F	Cryptantha humilis	-	4	-	-	1	-	.63	-
F	Draba spp. (a)	-	-	2	-	-	1	-	.00
F	Eriogonum alatum	1	3	-	1	1	-	.00	-
F	Erigeron pumilus	ab4	a-	b12	2	-	7	-	.08
F	Heterotheca villosa	-	-	1	-	-	1	-	.03
F	Lappula occidentalis (a)	-	-	3	-	-	1	-	.00
F	Lesquerella rectipes	b10	a-	a-	6	-	-	-	-
F	Microsteris gracilis (a)	-	4	3	-	2	1	.01	.00
F	Oenothera spp.	A-	b6	a-	-	4	-	.02	-
F	Pedicularis centranthera	-	-	4	-	-	2	-	.06

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'94	'99	'86	'94	'99	'94	'99
F	Penstemon pachyphyllus	$_{a}$9	$_{b}$20	$_{a}$7	3	10	3	1.54	.01
F	Petradoria pumila	$_{b}$118	$_{ab}$70	$_{a}$75	44	31	30	3.45	3.50
F	Phlox longifolia	-	-	2	-	-	2	-	.01
F	Sphaeralcea coccinea	-	2	2	-	1	2	.00	.01
Total for Annual Forbs		0	4	8	0	2	3	0.00	0.01
Total for Perennial Forbs		144	109	104	58	50	48	5.67	3.72
Total for Forbs		144	113	112	58	52	51	5.68	3.73

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 14 , Study no: 8

Type	Species	Strip Frequency		Average Cover %	
		'94	'99	'94	'99
B	Artemisia frigida	0	0	-	-
B	Artemisia tridentata vaseyana	53	53	7.89	11.36
B	Cercocarpus montanus	0	0	-	-
B	Chrysothamnus nauseosus	3	1	.01	-
B	Chrysothamnus viscidiflorus	0	2	-	-
B	Gutierrezia sarothrae	9	16	.01	.04
B	Juniperus osteosperma	0	6	2.57	4.34
B	Opuntia spp.	4	5	.00	.03
B	Pinus edulis	0	0	-	-
Total for Browse		69	83	10.48	15.78

CANOPY COVER --
Herd unit 14 , Study no: 8

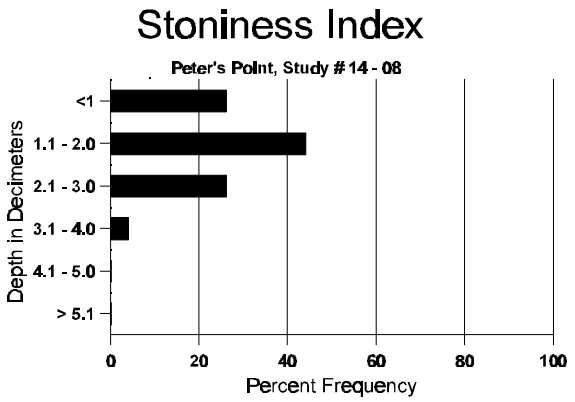
Species	Percent Cover '99
Juniperus osteosperma	2

BASIC COVER --
Herd unit 14 , Study no: 8

Cover Type	Nested Frequency		Average Cover %		
	'94	'99	'86	'94	'99
Vegetation	302	314	15.25	29.00	35.43
Rock	82	19	1.00	.50	.43
Pavement	165	145	1.25	.96	1.86
Litter	387	385	63.25	35.18	42.61
Cryptogams	41	64	0	.16	2.39
Bare Ground	320	295	19.25	32.11	34.52

SOIL ANALYSIS DATA --
Herd Unit 14, Study # 08, Study Name: Peters Point

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.8	56.6 (12.6)	7.2	62.9	18.6	18.6	2.3	8.5	86.4	0.6



PELLET GROUP DATA --
Herd unit 14 , Study no: 8

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	23	39	N/A
Deer	6	13	13 (32)
Elk	-	-	1 (2)
Cattle	-	2	7 (17)

BROWSE CHARACTERISTICS --
Herd unit 14 , Study no: 8

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia frigida																		
M	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100	9	7	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'86	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	100	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	86	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	94	23	-	-	-	-	-	-	-	-	23	-	-	-	460			23
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	86	13	2	1	-	-	-	-	-	-	15	1	-	-	533			16
	94	30	-	-	2	-	-	-	-	-	17	-	15	-	640			32
	99	14	-	-	1	-	-	-	-	-	15	-	-	-	300			15
M	86	15	16	4	-	-	-	-	-	-	32	-	3	-	1166	20	20	35
	94	52	19	6	1	-	-	-	-	-	22	1	55	-	1560	19	33	78
	99	81	4	4	1	-	1	-	-	-	91	-	-	-	1820	19	31	91
D	86	1	1	2	-	-	-	-	-	-	3	1	-	-	133			4
	94	24	4	1	-	-	-	-	-	-	6	-	18	5	580			29
	99	6	1	2	-	-	-	-	-	-	2	-	1	6	180			9
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	35%	13%	05%	
'94	17%	05%	67%	+34%
'99	04%	06%	06%	-17%

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	1832	Dec:	7%
	'94	2780		21%
	'99	2300		8%

Cercocarpus montanus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	33	31	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	64	55	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
S	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	12	19	1	-	-	-	-	-	-	23	2	7	-	1066			32
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	6	-	-	-	-	-	-	-	-	6	-	-	-	200	43	52	6
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15	14	0
	99	-	1	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
D	86	-	4	1	-	-	-	-	-	-	4	-	1	-	166			5
	94	4	4	-	-	-	-	-	-	-	1	-	-	7	160			8
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	53%	05%	19%	-89%
'94	50%	00%	88%	-88%
'99	100%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	1432	Dec:	12%
	'94	160		100%
	'99	20		0%

Chrysothamnus viscidiflorus																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	50%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	0%
	'94	0		0%
	'99	40		50%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
Y	86	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	26	-	-	-	-	-	-	-	-	26	-	-	-	520			26
M	86	22	-	-	-	-	-	-	-	-	22	-	-	-	733	6	6	22
	94	9	-	-	-	-	-	-	-	-	8	-	1	-	180	6	7	9
	99	53	-	-	-	-	-	-	-	-	53	-	-	-	1060	4	4	53
D	86	1	-	-	-	-	-	-	-	-	-	-	1	-	33			1
	94	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	04%	-78%
'94	00%	00%	20%	+87%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	899	Dec:		4%
'94	200			10%
'99	1580			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	86	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	-	1	-	-	-	-	-	-	-	1	-	-	-	33	88	42	1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	5	-	-	-	-	-	-	-	-	5	-	-	-	100	-	-	5
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	20%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	166	Dec:		-
'94	0			-
'99	140			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
Y	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	7	-	-	-	-	-	-	-	-	7	-	-	-	233	3	8	7
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40	5	15	2
	99	6	-	-	-	-	-	-	-	-	6	-	-	-	120	3	10	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	-73%
'94	00%	00%	00%	+33%
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	299	Dec:	-
	'94	80		-
	'99	120		-

Pinus edulis																		
S	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'94	0		-
	'99	0		-